

RAW SEQUENCE LISTING

The Biotechnology Systems Branch of the Scientific and Technical
Information Center (STIC) no errors detected.

Application Serial Number: 10/623,914A
Source: FW16
Date Processed by STIC: 3/22/07

ENTERED



IFW16

RAW SEQUENCE LISTING

DATE: 03/22/2007

PATENT APPLICATION: US/10/623,914A

TIME: 15:27:05

Input Set : A:\27708465.APP

Output Set: N:\CRF4\03222007\J623914A.raw

3 <110> APPLICANT: HERING, THOMAS M.
 4 JOHNSTONE, BRIAN
 6 <120> TITLE OF INVENTION: PROBES FOR CHONDROGENESIS
 8 <130> FILE REFERENCE: 27708/04065
 10 <140> CURRENT APPLICATION NUMBER: 10/623,914A
 11 <141> CURRENT FILING DATE: 2003-07-21
 13 <150> PRIOR APPLICATION NUMBER: 60/211,384
 14 <151> PRIOR FILING DATE: 2000-06-14
 16 <160> NUMBER OF SEQ ID NOS: 7
 18 <170> SOFTWARE: PatentIn Ver. 3.3
 20 <210> SEQ ID NO: 1
 21 <211> LENGTH: 2666
 22 <212> TYPE: DNA
 23 <213> ORGANISM: Homo sapiens
 25 <400> SEQUENCE: 1
 26 aatggagcga agaccatggg gactgagtac acagatgaag acacagaagc atagagagga 60
 27 taagtaatca ctagcaagtg gaagaaccgg gattcagatc cagaacaggc tgactccaga 120
 28 gtcactggct gtcattgtagt ttctcaact actgcctcag ctctacaatc ccagagtaaa 180
 29 gctcttctcc aaatgaagag ccaggaagag gtagagggtg caggaattaa actttgtaaa 240
 30 gccatgtccc tgggttccact gactttcaca gatgtggcca tagacttttc ccaagatgaa 300
 31 tgggagtggc tgaatcttgc tcagagaagt ttgtacaaga aggtgatgtt agaaaaactac 360
 32 aggaacctag tttcagtggg tctttgcatt tctaaaccag atgtgatctc cttactggag 420
 33 caagagaaaag acccttgggt gataaaagga gggatgaaca gaggcctgtg cccagacttg 480
 34 gagtgtgtgt ggggtgaccaa atcattatct ttaaaccagg atatttatga agaaaaatta 540
 35 ccccgcgcaa tcataatgga aagacttaaa agctatgacc ttgaatgttc aacattaggg 600
 36 aaaaaactgga aatgtgaaga cttgtttgag agggagcttg taaaccagaa gacacatttt 660
 37 aggcaagaga ccatcactca tatagatact cttattgaaa aaagagatca ctctaacaaa 720
 38 tctgggacag tttttcatct gaatacatta tcttatataa aacagatttt tcccatggaa 780
 39 gagagaatat ttaattttca tacagataag aaaagcttaa aaacacattc agttgtgaaa 840
 40 aaacacaagc aagaccgtgg agaaaagaaa cttttaaaat gtaatgactg tgagaaaata 900
 41 ttcagcaaaa tctcaaccct tactcttcac caaagaattc atacaggaga gaaaccctat 960
 42 gaatgtattg aatgtggaaa ggccttttagc cagagtggcc accttgctca acatcagaga 1020
 43 atacacacag gagaaaaacc ttttgaatgt actgaatgtg ggaaagcctt cagccagaat 1080
 44 gctcatcttg ttcaacacca gagagttcat actggagaga aaccttatca gtgtaagcag 1140
 45 tgtaataaag cattcagcca gcttgacac cttgctcaac atcagagggt ccacactgga 1200
 46 gagaaaccct atgaatgtat tgaatgtggg aaggctttta gtgattgctc atccctagct 1260
 47 catcatcgaa ggattcacac tgggaaaaga ccttatgaat gtattgactg tgggaaagct 1320
 48 ttcaggcaga atgcttctct tatacgtcat cggcgatatt atcactactg agagaaaccc 1380
 49 tttgactgta ttgattgtgg gaaggctttc actgatacaca taggacttat tcagcataag 1440
 50 agaattcata ctggagagag accttacaaa tgtaaatgtg gtgggaaggc ttttagccat 1500
 51 ggctcatctc tgacagtaca tcagagaatt catacaggag agaaacctta tgaatgcaat 1560
 52 atctgtgaga aagccttcag ccatcggtgg tctcttactc ttcactcagag agttcact 1620
 53 ggagagaaac cctatgaatg taaagaatgt gggaaaagct tccggcagag cacgcatctg 1680

see p. 6

RAW SEQUENCE LISTING

DATE: 03/22/2007

PATENT APPLICATION: US/10/623,914A

TIME: 15:27:05

Input Set : A:\27708465.APP

Output Set: N:\CRF4\03222007\J623914A.raw

```

54 gctcatcatc agagaattca tactggagag aaaccttatg aatgtaagga atgcagcaaa 1740
55 accttcagcc agaatgcaca cctcgcgcag catcagaaaa tacacactgg ggagaagcct 1800
56 tatgaatgta aggaacgtgg taaggccttc agtcagattg cacaccttgt tcagcaccag 1860
57 agagttcata ctggtgagaa gccttacgaa tgtattgaat gtgggaaggc ctttagtgat 1920
58 ggctcatatc ttgttcaaca tccgagactc cacagtggca aaagaccgta tgaatgtcct 1980
59 gaatgtggga aggcattcag gcagagggca tccttgattt gtcatcagag atgtcatact 2040
60 ggtgagaaac cttatgaatg taatgtttgt gggaaagcct ttagccatcg taaatccctt 2100
61 actctgcac agagaattca tacaggagag aaaccttatg agtgaagga atgtagcaaa 2160
62 gccttcagcc aggttgccca tcttactcta cataagagaa ttcatactgg agaaaggccc 2220
63 tatgagtga aagaatgtgg aaaagccttc aggcagagtg tacatcttgc tcatcatcag 2280
64 cgaattcata ccggagagtc atcagttatt ctctcctctg ccctcccata ccaccaagtc 2340
65 ctatagattc aatctcgtaa atgcttctag catccatctg cttttttcca gcacatgtcc 2400
66 catcatcata gtccaagacg caaccatctc atctggattt ctgcagtagc ataactgttg 2460
67 ccccttttgc ttctatcaac tacatgttta acactgtagg cagcctaacc ttttaaaaat 2520
68 aaaaatacat aatttatgtt attttcccat ttaaaacact tgatttgaaa aatatattaa 2580
69 ctaatccatt tcaaggattt agcacacact ggcataatag tattgctaaa taaatgctag 2640
70 ccattaaggt aaaaaaaaaa aaaaaa 2666

```

73 <210> SEQ ID NO: 2

74 <211> LENGTH: 717

75 <212> TYPE: PRT

76 <213> ORGANISM: Homo sapiens

78 <400> SEQUENCE: 2

```

79 Met Lys Ser Gln Glu Glu Val Glu Val Ala Gly Ile Lys Leu Cys Lys
80 1 5 10 15
82 Ala Met Ser Leu Gly Ser Leu Thr Phe Thr Asp Val Ala Ile Asp Phe
83 20 25 30
85 Ser Gln Asp Glu Trp Glu Trp Leu Asn Leu Ala Gln Arg Ser Leu Tyr
86 35 40 45
88 Lys Lys Val Met Leu Glu Asn Tyr Arg Asn Leu Val Ser Val Gly Leu
89 50 55 60
91 Cys Ile Ser Lys Pro Asp Val Ile Ser Leu Leu Glu Gln Glu Lys Asp
92 65 70 75 80
94 Pro Trp Val Ile Lys Gly Gly Met Asn Arg Gly Leu Cys Pro Asp Leu
95 85 90 95
97 Glu Cys Val Trp Val Thr Lys Ser Leu Ser Leu Asn Gln Asp Ile Tyr
98 100 105 110
100 Glu Glu Lys Leu Pro Pro Ala Ile Ile Met Glu Arg Leu Lys Ser Tyr
101 115 120 125
103 Asp Leu Glu Cys Ser Thr Leu Gly Lys Asn Trp Lys Cys Glu Asp Leu
104 130 135 140
106 Phe Glu Arg Glu Leu Val Asn Gln Lys Thr His Phe Arg Gln Glu Thr
107 145 150 155 160
109 Ile Thr His Ile Asp Thr Leu Ile Glu Lys Arg Asp His Ser Asn Lys
110 165 170 175
112 Ser Gly Thr Val Phe His Leu Asn Thr Leu Ser Tyr Ile Lys Gln Ile
113 180 185 190
115 Phe Pro Met Glu Glu Arg Ile Phe Asn Phe His Thr Asp Lys Lys Ser
116 195 200 205
118 Leu Lys Thr His Ser Val Val Lys Lys His Lys Gln Asp Arg Gly Glu

```

RAW SEQUENCE LISTING

DATE: 03/22/2007

PATENT APPLICATION: US/10/623,914A

TIME: 15:27:05

Input Set : A:\27708465.APP

Output Set: N:\CRF4\03222007\J623914A.raw

```

119      210      215      220
121 Lys Lys Leu Leu Lys Cys Asn Asp Cys Glu Lys Ile Phe Ser Lys Ile
122 225      230      235      240
124 Ser Thr Leu Thr Leu His Gln Arg Ile His Thr Gly Glu Lys Pro Tyr
125      245      250      255
127 Glu Cys Ile Glu Cys Gly Lys Ala Phe Ser Gln Ser Ala His Leu Ala
128      260      265      270
130 Gln His Gln Arg Ile His Thr Gly Glu Lys Pro Phe Glu Cys Thr Glu
131      275      280      285
133 Cys Gly Lys Ala Phe Ser Gln Asn Ala His Leu Val Gln His Gln Arg
134      290      295      300
136 Val His Thr Gly Glu Lys Pro Tyr Gln Cys Lys Gln Cys Asn Lys Ala
137 305      310      315      320
139 Phe Ser Gln Leu Ala His Leu Ala Gln His Gln Arg Val His Thr Gly
140      325      330      335
142 Glu Lys Pro Tyr Glu Cys Ile Glu Cys Gly Lys Ala Phe Ser Asp Cys
143      340      345      350
145 Ser Ser Leu Ala His His Arg Arg Ile His Thr Gly Lys Arg Pro Tyr
146      355      360      365
148 Glu Cys Ile Asp Cys Gly Lys Ala Phe Arg Gln Asn Ala Ser Leu Ile
149      370      375      380
151 Arg His Arg Arg Tyr Tyr His Thr Gly Glu Lys Pro Phe Asp Cys Ile
152 385      390      395      400
154 Asp Cys Gly Lys Ala Phe Thr Asp His Ile Gly Leu Ile Gln His Lys
155      405      410      415
157 Arg Ile His Thr Gly Glu Arg Pro Tyr Lys Cys Asn Val Cys Gly Lys
158      420      425      430
160 Ala Phe Ser His Gly Ser Ser Leu Thr Val His Gln Arg Ile His Thr
161      435      440      445
163 Gly Glu Lys Pro Tyr Glu Cys Asn Ile Cys Glu Lys Ala Phe Ser His
164      450      455      460
166 Arg Gly Ser Leu Thr Leu His Gln Arg Val His Thr Gly Glu Lys Pro
167 465      470      475      480
169 Tyr Glu Cys Lys Glu Cys Gly Lys Ala Phe Arg Gln Ser Thr His Leu
170      485      490      495
172 Ala His His Gln Arg Ile His Thr Gly Glu Lys Pro Tyr Glu Cys Lys
173      500      505      510
175 Glu Cys Ser Lys Thr Phe Ser Gln Asn Ala His Leu Ala Gln His Gln
176      515      520      525
178 Lys Ile His Thr Gly Glu Lys Pro Tyr Glu Cys Lys Glu Arg Gly Lys
179      530      535      540
181 Ala Phe Ser Gln Ile Ala His Leu Val Gln His Gln Arg Val His Thr
182 545      550      555      560
184 Gly Glu Lys Pro Tyr Glu Cys Ile Glu Cys Gly Lys Ala Phe Ser Asp
185      565      570      575
187 Gly Ser Tyr Leu Val Gln His Pro Arg Leu His Ser Gly Lys Arg Pro
188      580      585      590
190 Tyr Glu Cys Leu Glu Cys Gly Lys Ala Phe Arg Gln Arg Ala Ser Leu
191      595      600      605

```

RAW SEQUENCE LISTING

DATE: 03/22/2007

PATENT APPLICATION: US/10/623,914A

TIME: 15:27:05

Input Set : A:\27708465.APP

Output Set: N:\CRF4\03222007\J623914A.raw

193 Ile Cys His Gln Arg Cys His Thr Gly Glu Lys Pro Tyr Glu Cys Asn
 194 610 615 620
 196 Val Cys Gly Lys Ala Phe Ser His Arg Lys Ser Leu Thr Leu His Gln
 197 625 630 635 640
 199 Arg Ile His Thr Gly Glu Lys Pro Tyr Glu Cys Lys Glu Cys Ser Lys
 200 645 650 655
 202 Ala Phe Ser Gln Val Ala His Leu Thr Leu His Lys Arg Ile His Thr
 203 660 665 670
 205 Gly Glu Arg Pro Tyr Glu Cys Lys Glu Cys Gly Lys Ala Phe Arg Gln
 206 675 680 685
 208 Ser Val His Leu Ala His His Gln Arg Ile His Thr Gly Glu Ser Ser
 209 690 695 700
 211 Val Ile Leu Ser Ser Ala Leu Pro Tyr His Gln Val Leu
 212 705 710 715

215 <210> SEQ ID NO: 3

216 <211> LENGTH: 2143

217 <212> TYPE: DNA

218 <213> ORGANISM: Homo sapiens

220 <400> SEQUENCE: 3

221 gggagttctt gcaattccag aaccatgact gatgggttgg tgacattcag ggatgtggcc 60
 222 atcgacttct ctcaggagga gtgggaatgc ctggaccctg ctcagaggga cttgtacgtg 120
 223 gatgtaatgt tggagaacta tagtaacttg gtgtcactgg atttggagtc aaaaacgtat 180
 224 gagacaaaaa aatatttttc agaaaatgat atttttgaaa taaatttttc ccagtgggag 240
 225 atgaaggaca aaagtaaaac ccttggcctt gaggcattcca tcttcagaaa taattggaag 300
 226 tgcaaaagca tattcgaggg actaaaagga catcaagagg gatacttcag tcaaatgata 360
 227 atcagctatg aaaaaatacc ttcttacaga aaaagtaaat ctcttactcc acatcaaaga 420
 228 attcataata cagagaaatc ctatgtttgt aaggaatgtg ggaaggcttg cagtcattggc 480
 229 tcaaaacttg ttcaacatga gagaactcat acagctgaaa agcactttga atgtaaagaa 540
 230 tgtgggaaga attatttaag tgcctatcaa ctcaatgtgc atcagagatt tcatactggt 600
 231 gagaaaccct atgagtgtaa ggaatgtggg aagaccttta gctggggatc aagccttggt 660
 232 aaacatgaga gaattcacac tgggtgagaaa ccctatgaat gttaaagaatg tgggaaggcc 720
 233 tttagtctgt gctatcacct tacccaacat cagaaaattc atattgggtg gaaatcttat 780
 234 aaatgtaagg aatgtgggaa ggcctttttt tggggctcaa gccttgctaa acatgagata 840
 235 attcatacag gtgagaaacc ttataaatgt aaagaatgtg ggaaggcctt cagtcgtggc 900
 236 tatcaactta ctcagcatca gaaaatccat actggttaaga aaccttatga atgtaaaata 960
 237 tgtggaaagg ctttttggtg gggctatcaa ctactcgac atcagatatt tcatactggt 1020
 238 gagaaaccct atgaatgcaa ggaatgtggg aaggctttta attgctggtc aagtcctatt 1080
 239 caacatgaaa gaattcatatc tgggtgagaaa ctttatgaat gttaaagaatg tggaaaggcc 1140
 240 tttagtctgt gctatcacct ttctcaacat cagaaaatcc atactggtga gaaacctttt 1200
 241 gaatgtaagg aatgtgggaa ggccttttagt tggggttcaa gccttggtta acatgagaga 1260
 242 gttcatactg gtgagaaatc ccatgaatgt aaagaatgag gaaagacctt ttgtagtggg 1320
 243 tatcaactta ctcagacatca ggtattttcac actggtgaga aaccttatga atgtaaggaa 1380
 244 tgtgggaagg ctttttaattg tggatcaagc cttgttcaac atgaaagaat ccatacaggg 1440
 245 gagaaaccct atgaatgtaa agaatgtgga aggccttttag tctgtggctat caccttactc 1500
 246 aacatcagaa aattcatacc ggtgagaaac ctttcaaatg taaggaaatg gggaaggcct 1560
 247 tcagttgggg ttcaagccta gtttaagcatg agagagtcca tactaatgag aagtcttatg 1620
 248 aatgtaagaa ctgtgggaag gccttttggt gtggctatca acttagtggt catcagagat 1680
 249 ttcatactgg tgagaagctt tatcaacata aggaattcgg gaagaccttt actcgtggct 1740
 250 caaaacttgt tcatgagaga actcatagta atgataaacc ctacaaatat aacgaatgtg 1800

RAW SEQUENCE LISTING

DATE: 03/22/2007

PATENT APPLICATION: US/10/623,914A

TIME: 15:27:05

Input Set : A:\27708465.APP

Output Set: N:\CRF4\03222007\J623914A.raw

```

251 gggaagcctt tctgtggaca acttactcaa atgagaaaat tgatactgat gaaaccttat 1860
252 gattgaaagt tgtaaaagaa tattttgtgt gtgcgtatag acaacttatc ataataagaa 1920
253 ctcttactct tgagaaacct tgtgaatgta agggttgtgc aaaagccatt catttctgtt 1980
254 tatgggcaat tatcttgcta tccagcaatt catactagtg agaaatattt tgaatataat 2040
255 taatatgaaa aggccttttag acttctgtac agtcttattg gatatcaatt tatactgatg 2100
256 taaaatcatt taaatgaaaa aaaaaaaaaa aaaaaaaaaa aaa 2143
259 <210> SEQ ID NO: 4
260 <211> LENGTH: 518
261 <212> TYPE: PRT
262 <213> ORGANISM: Homo sapiens
264 <400> SEQUENCE: 4
265 Met Thr Asp Gly Leu Val Thr Phe Arg Asp Val Ala Ile Asp Phe Ser
266 1 5 10 15
268 Gln Glu Glu Trp Glu Cys Leu Asp Pro Ala Gln Arg Asp Leu Tyr Val
269 20 25 30
271 Asp Val Met Leu Glu Asn Tyr Ser Asn Leu Val Ser Leu Asp Leu Glu
272 35 40 45
274 Ser Lys Thr Tyr Glu Thr Lys Lys Ile Phe Ser Glu Asn Asp Ile Phe
275 50 55 60
277 Glu Ile Asn Phe Ser Gln Trp Glu Met Lys Asp Lys Ser Lys Thr Leu
278 65 70 75 80
280 Gly Leu Glu Ala Ser Ile Phe Arg Asn Asn Trp Lys Cys Lys Ser Ile
281 85 90 95
283 Phe Glu Gly Leu Lys Gly His Gln Glu Gly Tyr Phe Ser Gln Met Ile
284 100 105 110
286 Ile Ser Tyr Glu Lys Ile Pro Ser Tyr Arg Lys Ser Lys Ser Leu Thr
287 115 120 125
289 Pro His Gln Arg Ile His Asn Thr Glu Lys Ser Tyr Val Cys Lys Glu
290 130 135 140
292 Cys Gly Lys Ala Cys Ser His Gly Ser Lys Leu Val Gln His Glu Arg
293 145 150 155 160
295 Thr His Thr Ala Glu Lys His Phe Glu Cys Lys Glu Cys Gly Lys Asn
296 165 170 175
298 Tyr Leu Ser Ala Tyr Gln Leu Asn Val His Gln Arg Phe His Thr Gly
299 180 185 190
301 Glu Lys Pro Tyr Glu Cys Lys Glu Cys Gly Lys Thr Phe Ser Trp Gly
302 195 200 205
304 Ser Ser Leu Val Lys His Glu Arg Ile His Thr Gly Glu Lys Pro Tyr
305 210 215 220
307 Glu Cys Lys Glu Cys Gly Lys Ala Phe Ser Arg Gly Tyr His Leu Thr
308 225 230 235 240
310 Gln His Gln Lys Ile His Ile Gly Val Lys Ser Tyr Lys Cys Lys Glu
311 245 250 255
313 Cys Gly Lys Ala Phe Phe Trp Gly Ser Ser Leu Ala Lys His Glu Ile
314 260 265 270
316 Ile His Thr Gly Glu Lys Pro Tyr Lys Cys Lys Glu Cys Gly Lys Ala
317 275 280 285
319 Phe Ser Arg Gly Tyr Gln Leu Thr Gln His Gln Lys Ile His Thr Gly
320 290 295 300

```

RAW SEQUENCE LISTING ERROR SUMMARY
PATENT APPLICATION: US/10/623,914A

DATE: 03/22/2007
TIME: 15:27:06

Input Set : A:\27708465.APP
Output Set: N:\CRF4\03222007\J623914A.raw

FYI

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:5; N Pos. 6,9,18

Seq#:7; Xaa Pos. 1,2,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23

Seq#:7; Xaa Pos. 24,25,26,27,29,30,31,33,34,35,36,37,39,40,42,43,44,45,46

VERIFICATION SUMMARY

DATE: 03/22/2007

PATENT APPLICATION: US/10/623,914A

TIME: 15:27:06

Input Set : A:\27708465.APP

Output Set: N:\CRF4\03222007\J623914A.raw

L:390 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:0
L:452 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7 after pos.:0
L:455 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7 after pos.:16
L:458 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7 after pos.:32